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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,827	03/30/2004	Felix Margadant	015258-062700US	6493

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TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER

HAJNIK, DANIEL F

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/814,827	Applicant(s) MARGADANT, FELIX	
	Examiner Daniel F. Hajnik	Art Unit 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Objections

1. Claims 1, 7-10 are objected to because of the following informalities: Please remove all reference numbers embedded in the claim language i.e. in claim 1 the phrase "generate a pictorial representation (5)" should be "generate a pictorial representation ~~(5)~~". Appropriate correction is required.
2. Claims 2-10 are objected to because of the following informalities: Please change "A method in accordance with claim 1" to "The method in accordance with claim 1". Appropriate correction is required.
3. Claim 1 is objected to because of the following informalities: Please change "visualising" to "visualizing". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 2, 7, 9, and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. Regarding claims 2, 7, 9, and 10, the phrase "in particular" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d). In this office action, the examiner will assume and apply art only to the parts of the claims that do not make reference to "in particular".

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-5, 7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldgof et al. (NPL Document "The Use of Three- and Four-Dimensional Surface Harmonics for Rigid and Nonrigid Shape Recovery and Representation", herein referred to as "Goldgof").

As per claim 1, Goldgof teaches the claimed "an illumination model" by teaching of "One can see that the general shape of the head can be modeled well with surface harmonics, but it may be necessary to add a local model to more accurately represent the facial features" (2nd paragraph under section B.4) (pg. 976) where these surface harmonics are based upon an illumination model (also see spherical harmonics shown in figures 7, 13, and 16).

Goldgof teaches the claimed "a volume element" by teaching of "Each bit of the sample represents one voxel of the three-dimensional frame" (1st paragraph under section B.1) (pg. 973).

Goldgof teaches the claimed "a measurement coordinate system" by teaching of "B.4. Range Data in Cylindrical Coordinates" (pg. 976) and by teaching of "Laser scan

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range data samples of the human head ... In these samples the surface points were obtained in a cylindrical manner" (1st paragraph under section B.4) (pg. 976)

Goldgof teaches the claimed "the illumination model (BM) is evaluated in the measurement coordinate system" by teaching of "modeled well with surface harmonics" (2nd paragraph under section B.4) (pg. 976) and by teaching of the section titled: "A. Surface Harmonics in Various Coordinate Systems" (pg. 977), the sub-section titled "A. I. Spherical Coordinates" (pg. 977), and the sub-section titled "A.2 Circular Cylindrical Coordinates" (pg. 978).

Goldgof does not explicitly teach the claimed "being loaded as at least one texture". However, Goldgof teaches of an "Endocardial surface of a canine left heart" (pg. 973, figure 7 caption) and teaches of volumetric tomography which consists of a plurality of volume cross sections (1st paragraph under section B.1) (pg. 973 and figure 8). The submitted specification teaches that "an original volume G' sub ϕ is represented up by a three-dimensional data set D' which is built up of one or more 2D or 3D textures T' sub ρ , such a three-dimensional data set D' is frequently also termed a 3D texture" (pg. 5, lines 14-17) and the texture is shown in figure 2, labeled T' sub ρ . Based upon these application teachings and the teachings of the reference, it would have been obvious to one skill in the art at the time of invention to use the claimed feature. Goldgof could use textures to further add detail to the plurality of volume cross sections shown in figure 8. Such textures may enhance the overall quality of the picture of the data shown.

As per claim 2, Goldgof teaches the claimed "the data ... of the data set (D) are processed without transformation from the measurement coordinate system (K.sub.M) into another coordinate system" by teaching of measuring the data in Cylindrical Coordinates (pg. 976, section B.4) and performing spherical harmonics on the measured data also using a Cylindrical Coordinates (see Goldgof cited teachings from claim 1 above).

As per claims 3 and 4, Goldgof teaches the claimed "the measurement coordinate system (K.sub.M) is a non-Cartesian measurement coordinate system" and teaches the claimed "the measurement coordinate system (K.sub.M) is a cylindrical system or a spherical coordinate system (K.sub.M)" by teaching of "B.4. Range Data in Cylindrical Coordinates" (pg. 976) and by teaching of "Laser scan range data samples of the human head were provided ... In these samples the surface points were obtained in a cylindrical manner" (1st paragraph under section B.4) (pg. 976).

As per claim 5, Goldgof teaches the claimed "linear interpolation" by teaching of "The method is also useful in interpolating or smoothing the data" (5th paragraph under section I) (pg. 967).

As per claim 7, Goldgof teaches the claimed "the data ... of the data set (D) represent a volume resolved scan of a body ... and in which the pictorial representation (5) is a three-dimensional representation" in figure 18 (scan of a body, pg. 976) and by

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teaching of "the three-dimensional frame" (pictorial representation) (1st paragraph under section B.1) (pg. 973).

As per claim 10, Goldgof teaches the claimed "fast generation of three dimensional representations (5) of a body" by teaching of "The method is very much analogous to reducing a digitally sampled time sequence to a few low frequency Fourier components" (4th paragraph under section I) (pg. 967) such a reduction in sampling will make the generation process faster.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goldgof in view of Napoli et al. (US Pub 2002/ 0105518, herein referred to as "Napoli").

As per claim 6, Goldgof does not explicitly teach the claimed "the illumination model in the data set (D) is evaluated close to a singularity". Napoli teaches the claimed limitation by teaching of "The cylindrical coordinates of a point on the entry segment 54 and a point on the projected exit-segment 58 are calculated to have angle, radius and height" (paragraph [0049]) where if the radius is very small then the reference would be evaluated close to a singularity. It would have been obvious to one of ordinary skill in the art at the time of invention to combine Goldgof and Napoli. One advantage of the combination may be to render smaller details and render smaller radius values.

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10. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldgof in view of Moser et al. (NPL Document "A 3-D Transesophageal Ultrasonic Scanner for Real-Time Heart Imaging and Catheter Navigation", herein referred to as "Moser").

As per claim 8, Goldgof does not explicitly teach the claimed "the pictorial representation (5) is generated as a stereoscopic projection". Moser teaches the claimed limitation by teaching of "LCD shutter glasses (stereoscopic glasses)" (2nd paragraph in 2nd col). It would have been obvious to one of ordinary skill in the art at the time of invention to combine Goldgof and Moser. One advantage to the combination is provided by Moser, which teaches of "the operator gets a true 3D view into the beating heart chambers" (2nd paragraph in 2nd col).

As per claim 9, Goldgof teaches the claimed "the data ... of the data set (D) are generated by means of an ultrasonic measuring device" by teaching of "ultrasonic scan head" (top of 2nd col). It would have been obvious to one of ordinary skill in the art at the time of invention to combine Goldgof and Moser. One advantage to the combination is provided by Goldgof, which teaches of "One application where spherical harmonics are commonly used is the modeling of the surface of the heart" (3rd paragraph under section I) (pg. 967) where the ultrasound device of Moser is also measuring the heart.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel F. Hajnik whose telephone number is (571) 272-7642. The examiner can normally be reached on Mon-Fri (8:30A-5:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka J. Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel F. Hajnik 2/2/06

DFH



Kee M. Tung
Primary Examiner